



TRU WASTE PILOT RETRIEVAL

618-10/11 Workshop

June 10, 2003

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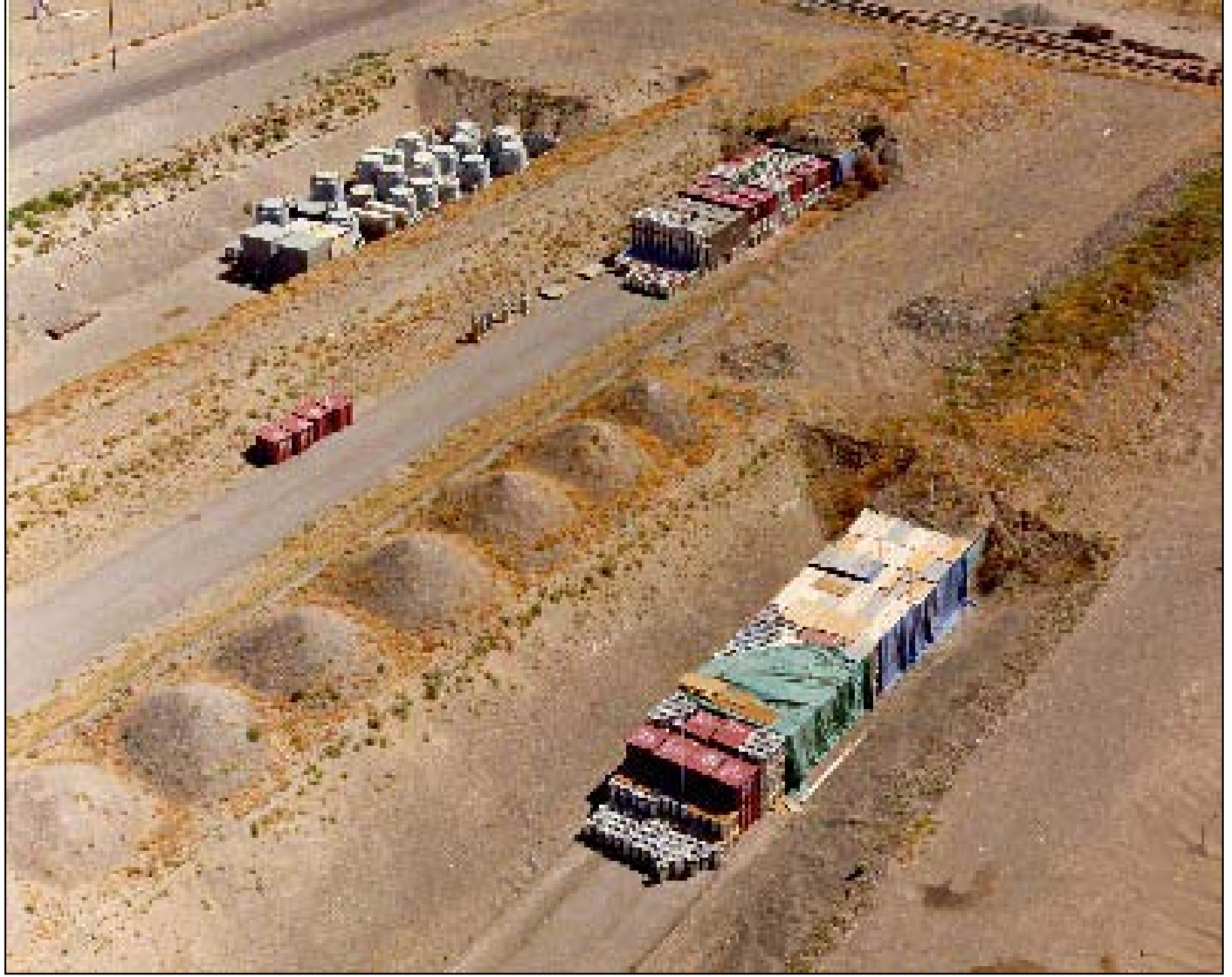
TRU Waste Pilot Retrieval

○ BACKGROUND

- Hanford Burial Grounds-200 E and 200 W Areas
- Six Burial Grounds
- Low Level Waste, Mixed Low Level Waste Disposed
- Transuranic Waste “Retrievably Stored” in Four Burial Grounds and 25 Trenches beginning in May 1970 through 1987





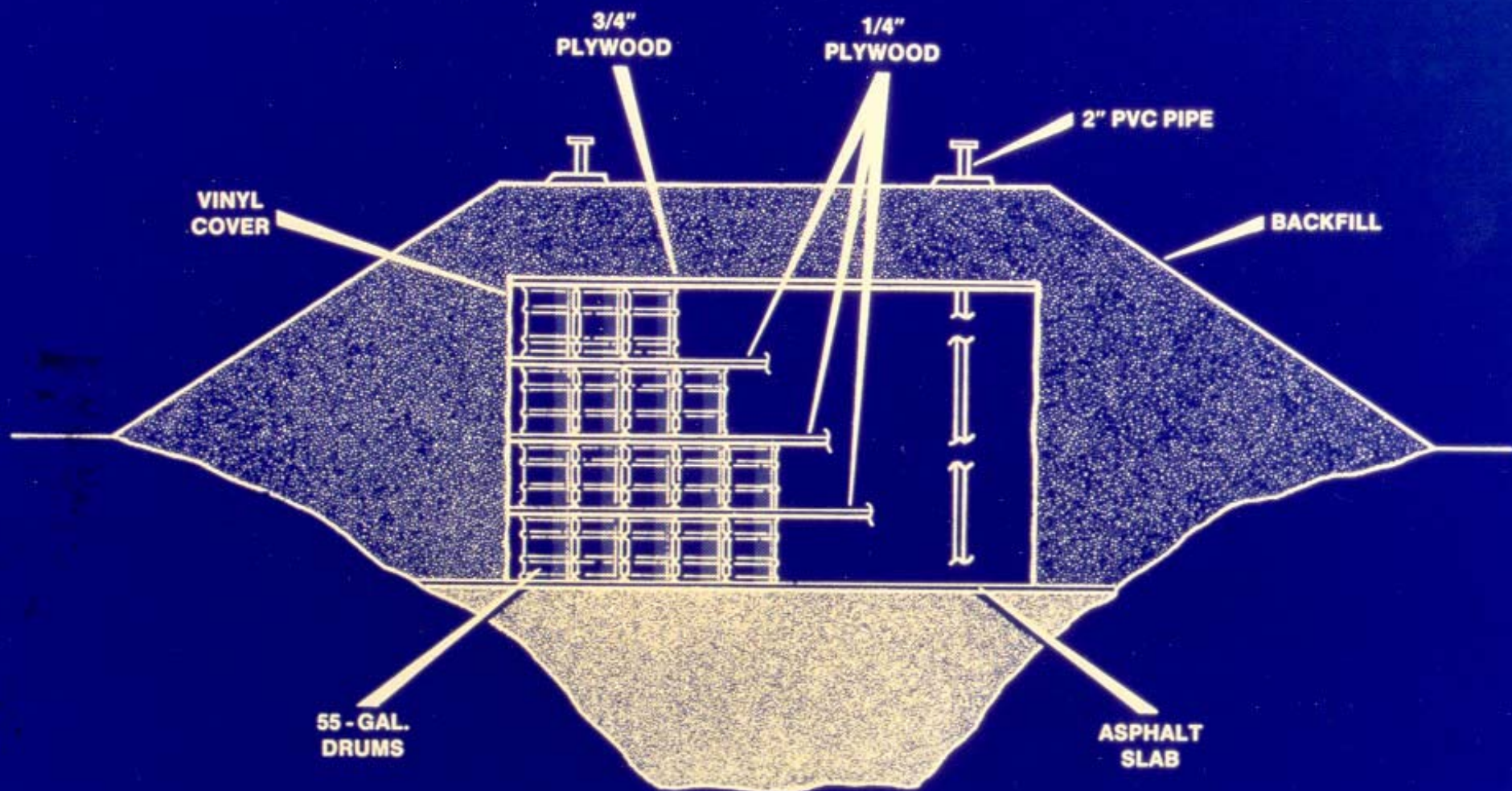




TRU Waste Pilot Retrieval

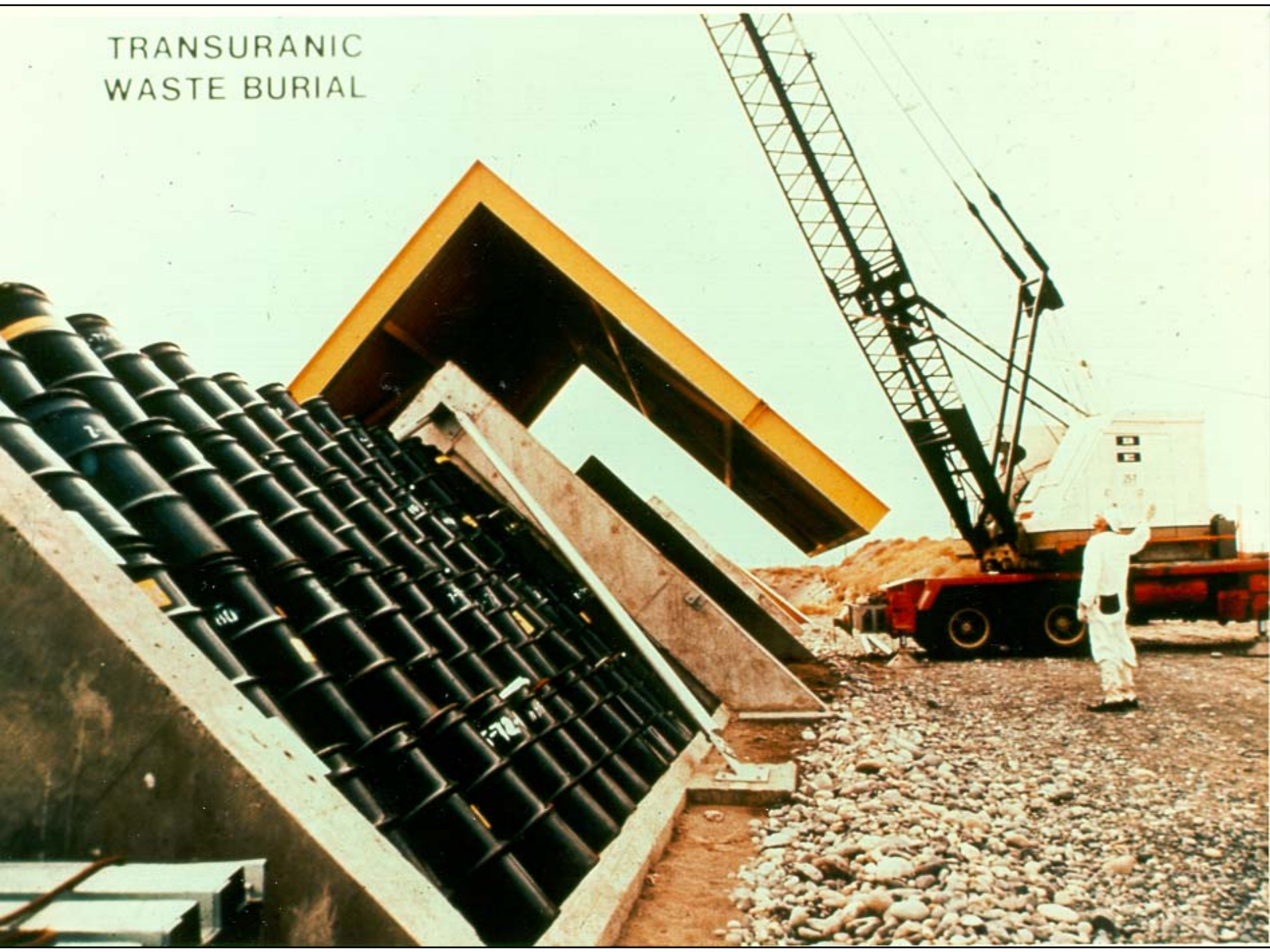
- BACKGROUND (continued)
 - Over 37,000 drums and almost 1100 boxes and other containers identified as retrievably stored TRU waste
 - Retrievable storage was to be for 20 years
 - Four different storage configurations:
 - Drums placed horizontally
 - Drums place in “V” configuration
 - Drums stacked vertically on soil
 - Drums stack vertically on asphalt pad

TYPICAL POST-1970 TRU INTERIM STORAGE

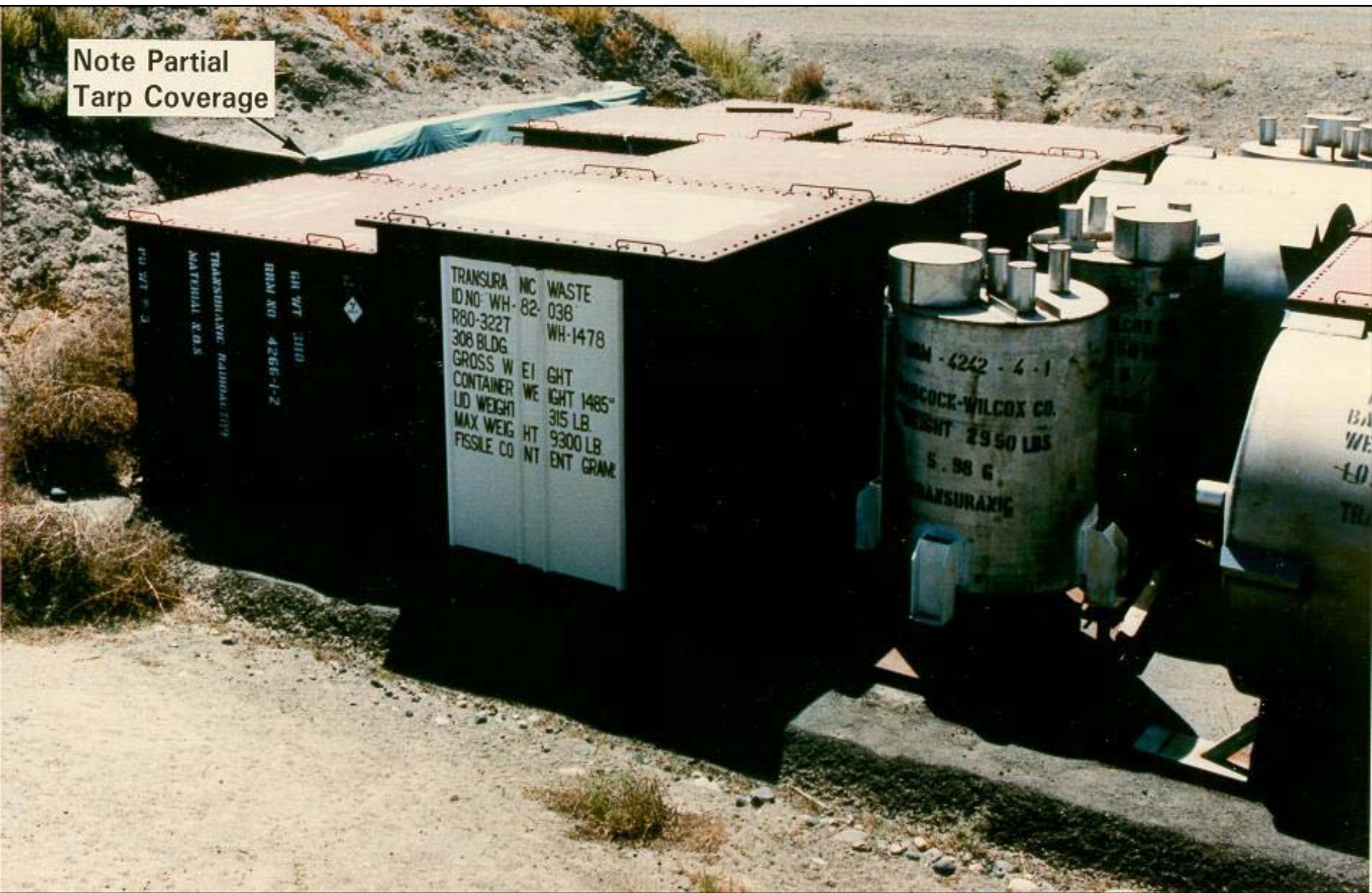




TRANSURANIC WASTE BURIAL



Note Partial
Tarp Coverage



TRANSURA MC WASTE
ID NO: WH-82-036
R80-3227 WH-1478
308 BLDG
GROSS W EI GHT
CONTAINER WE IGT 1485"
LID WEIGHT 315 LB
MAX WEIG HT 9300 LB
FISSILE CO NT ENT GRAM

WH-4242-4-1
WILCOX-WILCOX CO.
WEIGHT 2950 LBS
S. 98 G.
TRANSURAXIC



TRU Waste Pilot Retrieval

- Why Retrieve a Small Quantity?
 - Obtain data on container corrosion
 - Monitor condition of container stack
 - Conduct limited TRU waste retrieval activities for operational planning
 - Confirm container placement data records
 - Obtain waste containers for analyses



TRU Waste Pilot Retrieval

○ Approach

- Initiate Retrieval Summer 1994
- One location: Burial Ground 4C, Trench 4
 - Over 9800 drums
 - Emplaced 1978-1987
 - Vertical stack on asphalt
- One module: all drums, emplaced in 1982-84
- Retrieve 200-300 drums



TRU Waste Pilot Retrieval

- Approach (continued)
 - Retrieve from all four “layers”
 - Take NDE drum wall thickness measurements on additional drums
 - Visual observations on additional drums
 - Move drums to Central Waste Complex RCRA permitted storage



TRU Waste Pilot Retrieval

○ Actions

- Preparation began in Summer 1992
 - Planning documentation
 - Mock-up design
 - Module bracing structure fabrication
 - Procedures
 - Trench module locations by ground penetrating radar



TRU Waste Pilot Retrieval

- Actions (continued)
 - Mock-up
 - Module of non-radioactive drums buried
 - Module bracing installation attempted
 - Handling processes practiced



TRU Waste Pilot Retrieval

- Actions (continued)
 - Mock-up
 - Bracing modifications worked
 - Training successfully completed
 - Operational Readiness
 - Affidavits
 - Procedures
 - Training records
 - Operational Readiness Review
 - Several weeks long



TRU Waste Pilot Retrieval

- Actions (continued)
 - DOE RL Operational Readiness Evaluation in February 1994
 - Initial effort failed
 - Second ORE in April 1994
 - Successful, with final procedure modifications and training records to be signed off prior to start



TRU Waste Pilot Retrieval

- Actions (continued)
 - Plans to begin retrieval in May 1994
 - Technical Question Regarding Drum Venting from RL/DNFSB
 - Hanford style vent clips
 - How did we know that the drum vents work?
 - Conducted literature search on design and testing
 - No definitive proof found.



TRU Waste Pilot Retrieval

- Technical Question

- Initiated drum lid visual/measurement evaluation
- Conclusion: Risk is small and adequate personnel safeguards are in place
 - No personnel over the drum lid during movements
 - Inspection for obvious drum lid bulging by at least two individuals before any handling
 - Drum movement specifically authorized



TRU Waste Pilot Retrieval

- Actions (continued)
 - Moved First Shovel of Dirt on July 28, 1994
 - Then used crane operated dragline bucket to remove dirt cover down to approximately one foot of containers
 - Hand shoveled to top of containers
 - Then used dragline bucket to move “face” cover to within approximately one foot of containers-top two rows only



TRU Waste Pilot Retrieval

- Follow-on Activities:
 - Retrieved First Drum:
 - No surface contamination
 - Radiation levels consistent with expectations
 - Visual inspection of bottom of drum: OK
 - Handling went well
 - Drum identification as expected
 - Reviewed Actions to Date: No Need to Change



TRU Waste Pilot Retrieval

- Actions (continued)
 - Initial Observations:
 - Tarp was basically intact
 - Drums appeared to be stable in the stack
 - Locations as expected
 - Radiation levels as expected
 - No soil contamination
 - No smearable contamination on tarp
 - No airborne contamination



TRU Waste Pilot Retrieval

- Follow-on Activities (continued):
 - Cut Tarp Vertically: All OK
 - Drums look OK
 - Exposed additional drums on top two layers
 - Drums at corner of stack showed more surface corrosion
 - Initial field evaluated wall thickness readings showed small amount of uniform corrosion
 - Base of drums, in contact with plywood, showed some surface corrosion
 - Plywood in good condition



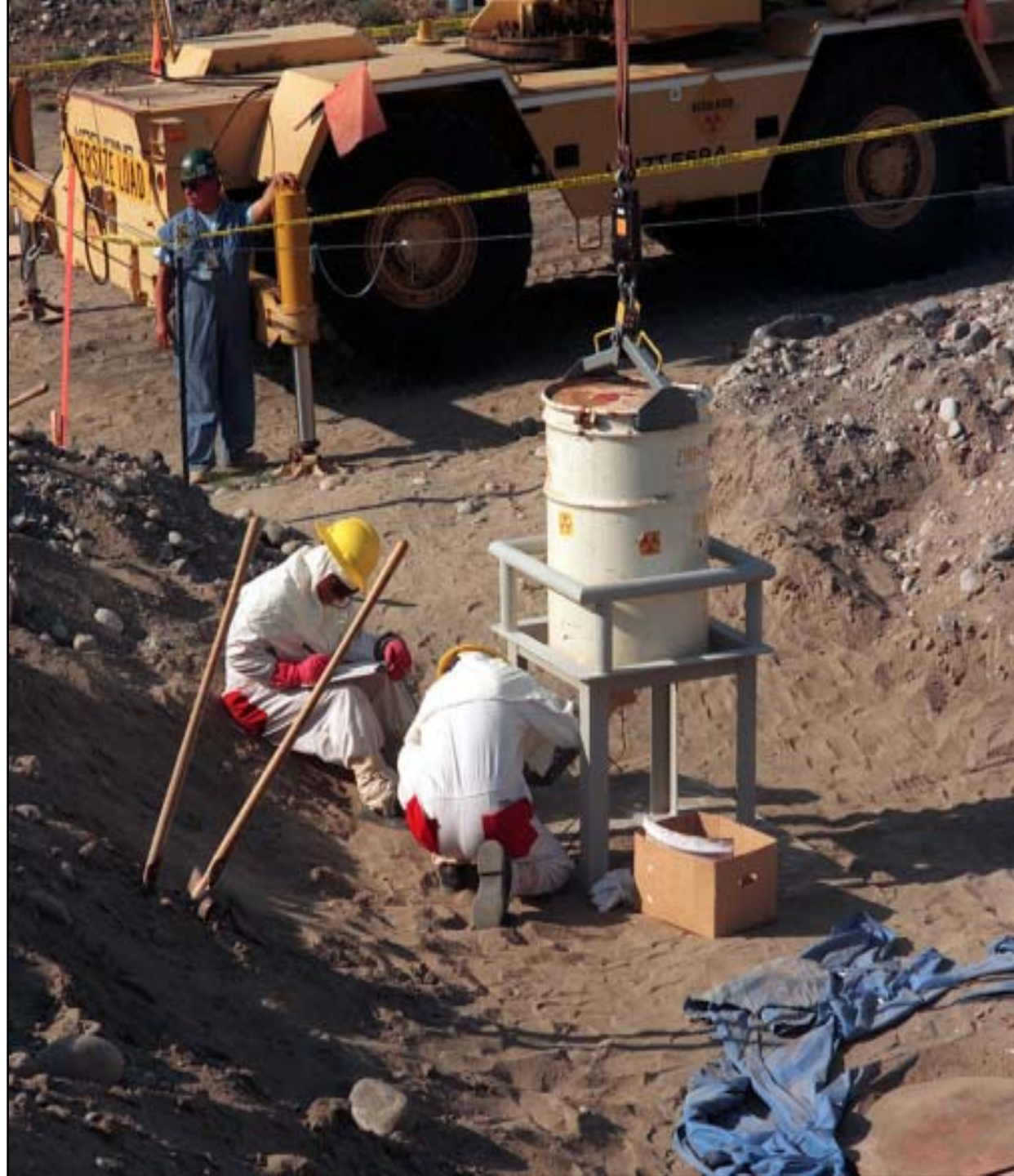








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TRU Waste Pilot Retrieval

- Follow-on Activities (continued):
 - Operators Stood on Plywood to Perform Duties
 - Plywood Cut with Power Saw to Provide Access
 - Drums Handled by Clamp on Top of Drum
 - Inspection Stand Used to Visually Inspect Bottom of Drum
 - Drums Transferred to Storage by Covered Van



TRU Waste Pilot Retrieval

- Follow-on Activities (continued):
 - Continued Drum Retrieval
 - Conducted NDE on drums deeper in stack
 - Found an area of higher than expected radiation
 - Some minor drum identification differences
 - One Drum with Pinholes
 - Two pencil sized penetrations
 - Located where tarp had been in contact
 - No radiation contamination
 - Drum sealed and left in place





TRU Waste Pilot Retrieval

- Follow-on Activities (continued):
 - Corrosion at Bottom of Drum an Integrity Concern
 - Unable to tell extent of corrosion visually
 - NDE not effective in “rough” area
 - Operators wanted assurance of structural integrity
 - Modified procedure to tip drum slightly and insert support plate under drum





TRU Waste Pilot Retrieval

- Follow-on Activities (continued):
 - Retrieved a Total of 28 Drums from Top Two Tiers of Module
 - Funding constrained
 - Completed Retrieval Activities in October 1995
 - Obtained More Than 350 NDE Wall Thickness Measurements
 - No Final Report Issued





TRU Waste Pilot Retrieval

- Follow-on Activities (continued):
 - Evaluated Volatile Gases in 10 Drums
 - No unexpected compounds
 - Hydrogen very low
 - Ten Drums with High Amounts of Pu-239
 - Non destructive assay results varied from recorded gram quantities
 - Both higher than listed and lower than listed values found: not predictable.
 - Maximum differences were in the 20% range



TRU Waste Pilot Retrieval

- Conclusions/Lessons Learned:
 - Mock-up work helpful for training and procedures
 - ORR is NOT the technique to identify gaps or shortcomings
 - Visual Observations/Perceptions are Important Data Considerations
 - Have Potential “Anomalies” Plans in Place



TRU Waste Pilot Retrieval

- Conclusions/Lessons Learned (continued):
 - Placement Records System Good
 - Drum contents: no conclusion, as drums were not opened and examined
 - The tarped module provided a “green house” effect by trapping moisture
 - Handling procedures basically sound



TRU Waste Pilot Retrieval

- Conclusions/Lessons Learned (continued):
 - Contact between the drum and tarp can increase localized corrosion rates
 - The corrosion rate model for Hanford drums of about one mil per year of uniform corrosion was validated

618-10/11

July 1962









